# What pollinators want: a comprehensive plant-insect DNA-based analysis of Milan urban ecosystems

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**Abstract**:

Pollinators such as bees, bumblebees and hoverflies play a pivotal role in ecosystems by supporting the sexual reproduction of most wild plants and crops. The pollinator community is complex in terms of both taxonomic diversity and diagnosability and in the diversity of its functional traits.

A comprehensive and multifaceted analysis of the group of pollinating species is crucial to preserve their biodiversity and the benefit they provide to ecosystems and their inhabitants. Human-induced alterations of land use, such as urbanization, agriculture as well as other kinds of disturbance (e.g., pollution and the spread of invasive species) significantly impact pollinators.

Italy's diverse landscape hosts over 1000 species of bees, which, along with hoverflies and other insects, form the pollinator group thus underlying the richness and importance of this community and the necessity of its maintenance.
This thesis project examines 725 samples (collected in the period May-July 2023, thus capturing the different phenologies in pollinator communities) from the city of Milan in particular in 8 sites across a gradient of green areas fragmentation and coverage.

Employing advanced molecular-based techniques- such as DNA barcoding and metabarcoding- this project focuses on species identification, their foraging behavior and their interactions at the urban and national level. First results reveal a complex interaction network across the urbanization gradient.

This pioneering study, as an integral part of the National Biodiversity Future Center (Spoke 5 - Urban Biodiversity), anticipates the construction of a comprehensive dataset detailing the intricate relationships between various pollinator species and their dietary habits across different urban settings in Italy. This dataset aims to serve as a foundational resource for future research endeavors, facilitating a deeper understanding of the ever-evolving dynamics of urban ecosystems and providing a basis for comparative studies and long-term monitoring of pollinator populations in urban areas, holding practical significance for urban green space management, promoting NBS (Nature-based solutions) and conservation strategies.